Science, Service, Stewardship

Overview of SEFSC Assessments
Gulf of Mexico Brown Shrimp

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NOAA FISHERIES SERVICE

Seven Commercial Shrimp Species:

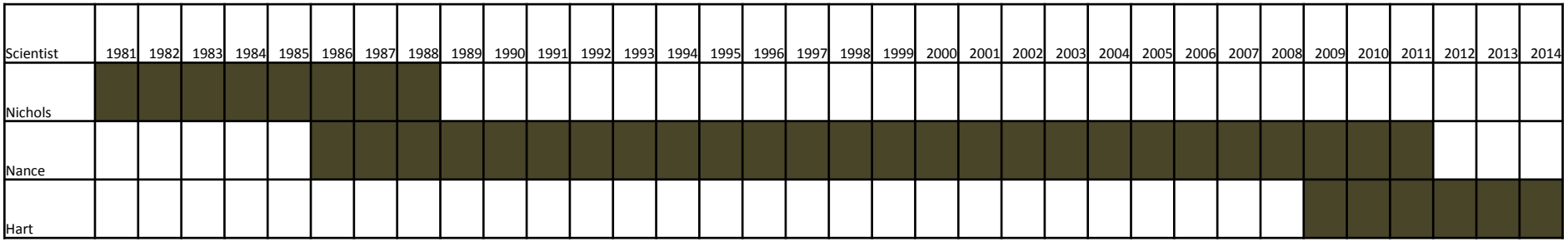
Species	South Atlantic	Gulf of Mexico
Brown Shrimp (Farfantepenaeus aztecus)		
White Shrimp (Litopenaeus setiferus)		
Pink Shrimp (Farfantepenaeus duorarum)		
Seabob Shrimp (Xiphopenaeus kroyeri)		
Rock Shrimp (Sicyonia brevirostris)		
Sugar Shrimp (Rimapenaeus constrictus)		
Royal Red Shrimp (Hymenopenaeus robustus)		

*Shrimp are highest valued fisheries in the Southeast.
>$400 Million Annual Ex-vessel value.

Shrimp Species Assessment Levels:

- Brown Shrimp (GOM): size structured model
- White Shrimp (GOM): size structured model
- Pink Shrimp (GOM): size structured model
- Royal Red Shrimp (GOM): index only
- Brown Shrimp (SA): index only
- White Shrimp (SA): index only
- Pink Shrimp (SA): index only
- Rock Shrimp (SA): index only

Shrimp Stock Assessment Leads:



› Only 3 assessment leads since 1981.

› Most years 1 individual has been responsible for all the shrimp assessments.

History of Shrimp Assessments: Gulf of Mexico

- Frequency: annual
- Size-structured model
  - Brown, white, and pink shrimp
  - Untuned VPA 1981-2010 (29 yrs)
  - Stock Synthesis 2009-present (4 yrs)
  - Overfished / Overfishing indices – early 1990s
- Index only
  - Royal red shrimp
  - Catch limit
  - Overfished / Overfishing indices – early 1990s

History of Shrimp Assessments: South Atlantic

› Frequency: annual

› Index only

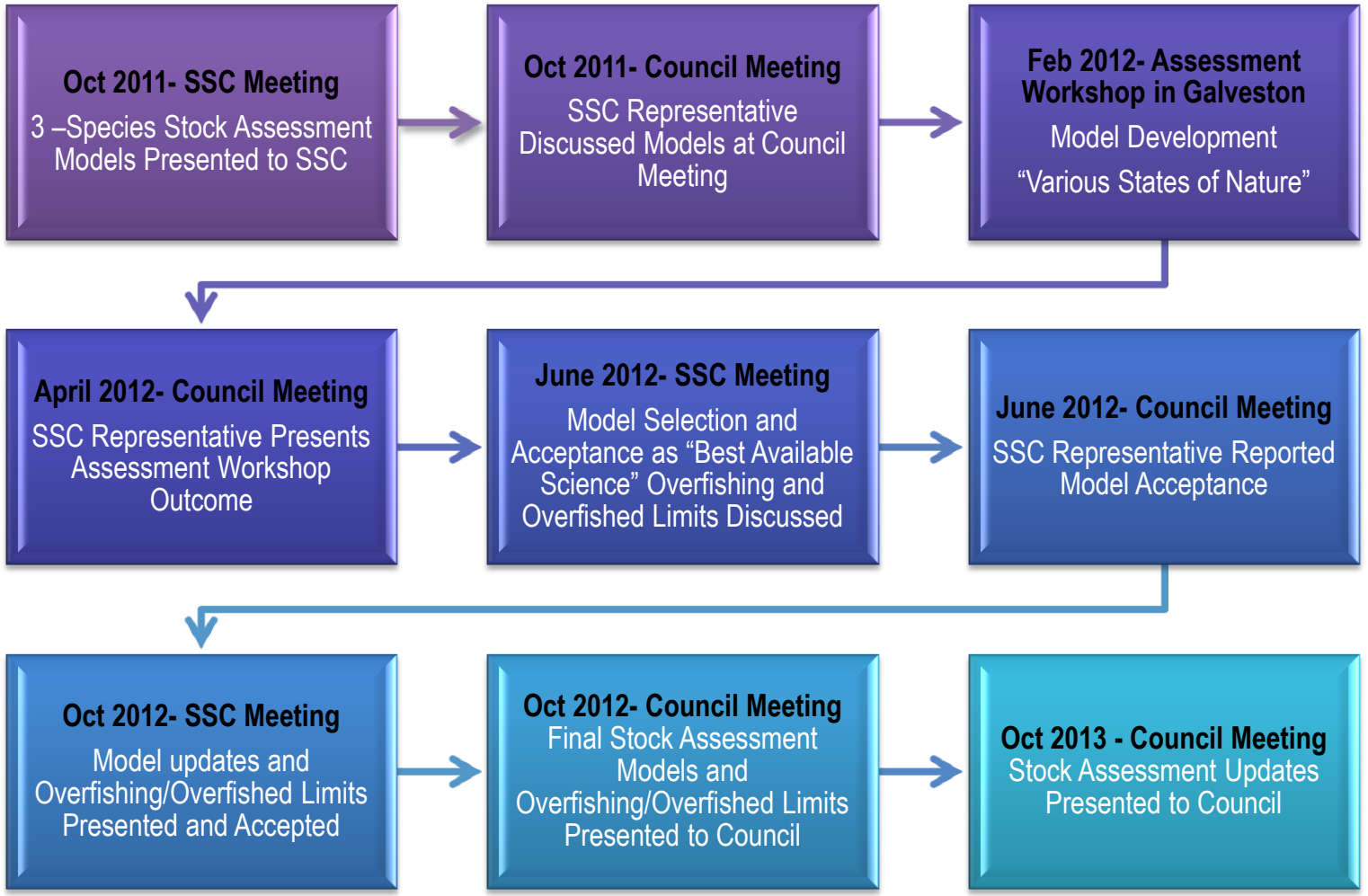
Brown, white, pink, and rock shrimp

› Overfished / Overfishing indices (early 1990s)

› Workshop (July 2014) to develop assessment methodology.

Shrimp Assessment Example: Gulf of Mexico Brown Shrimp

Stock Synthesis Shrimp Assessment: Model Development (non-SEDAR)



Assessment Schedule:

› May – July: Data gathering and pre-assessment dataset refinement.

› August – September: Model development.

› October: Assessment presentation to GMFMC Shrimp SSC.

› November: Assessment presentation to GMFMC Shrimp Committee.

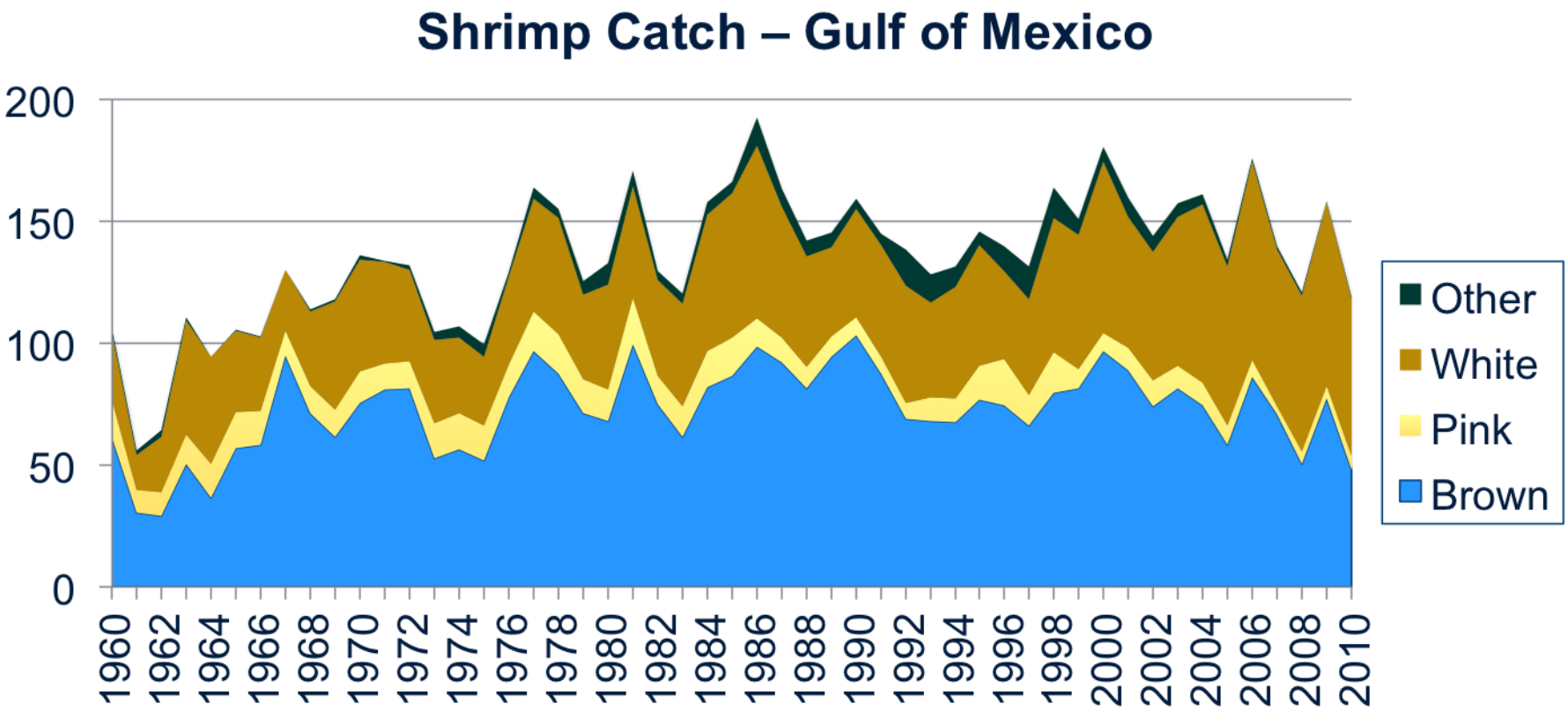
Pre-Assessment Data Preparation:

› Shrimp Landing Files – Catch by Month and Size

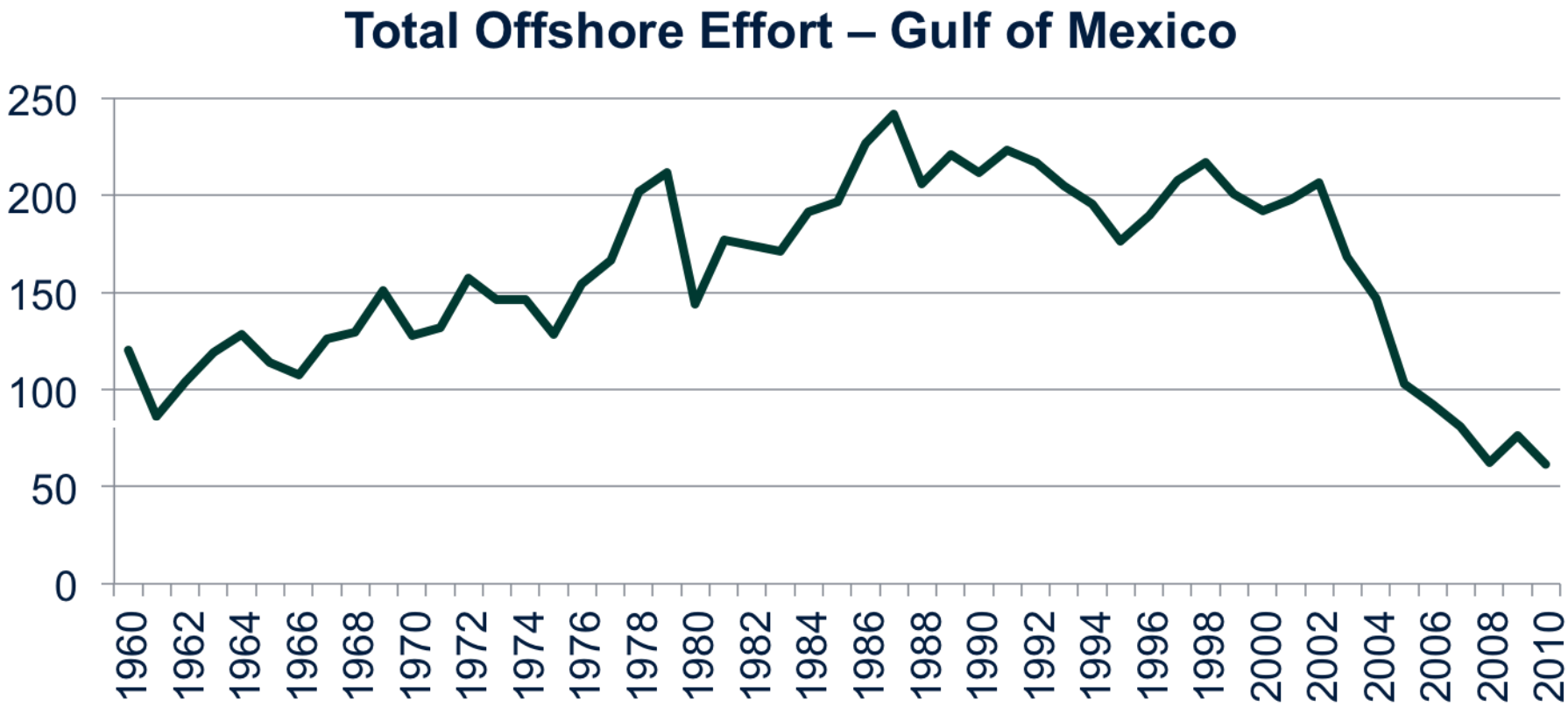
› Shrimp Effort Files – Interviews and ELB

› SEAMAP Trawl Survey Data

› State Trawl Shrimp Abundance Data

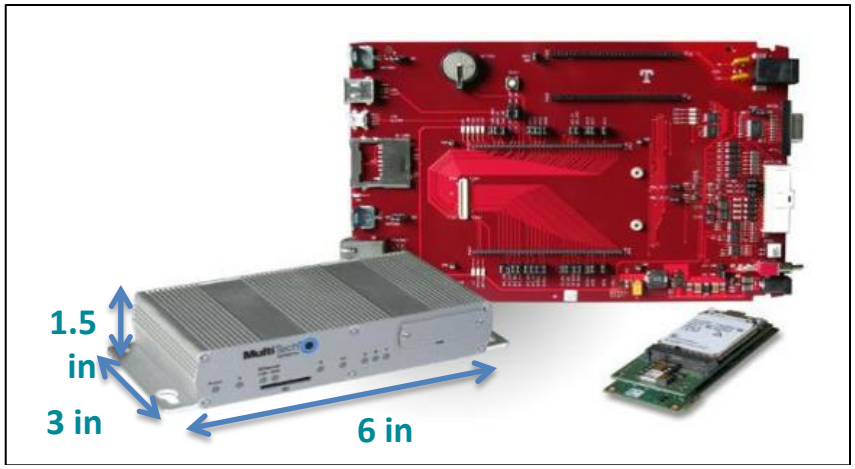


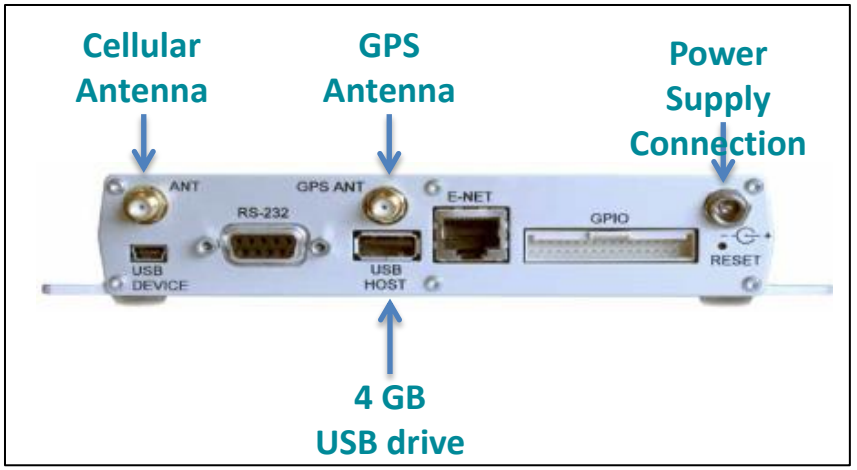
Landings by date, location, and size. About 85,000 trips in year. 1,500 offshore vessels; several thousand inshore vessels.

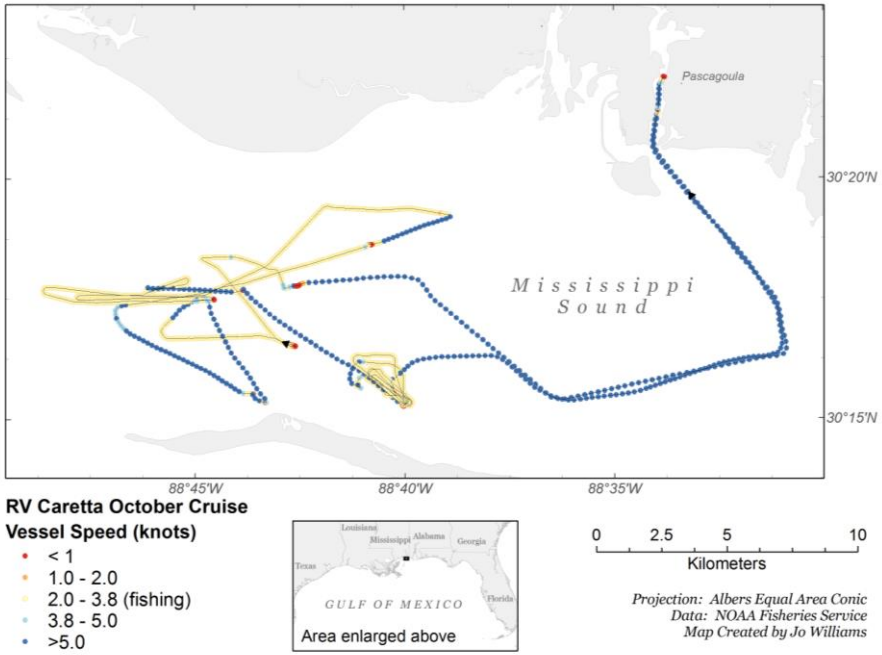


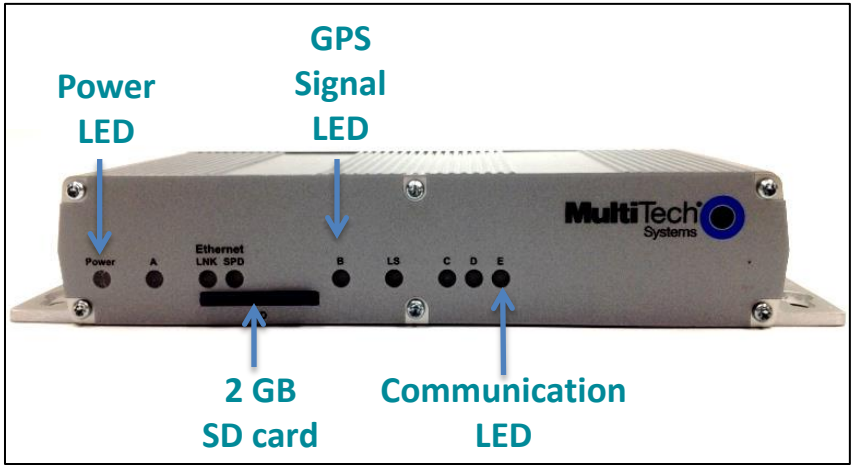
Effort estimation is accomplished using CPUE data collected through NMFS port agent interviews (1960 – present) and ELB program (2006 – present).

MultiConnect™ OCG-D Features









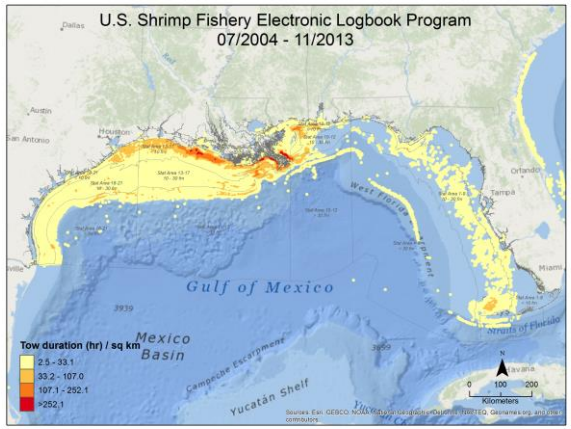
Model and Data Inputs: Commercial Catch / Effort Data

The Stock Synthesis model was developed using catch data from 1984-2012 (28 yrs).

The model structure included 2 fleets:

Commercial Shrimp Offshore Fleet 1 and Inshore Fleet 2 (statistical zones 7-21)

- Directed fishing effort by year and month
- Catch by year, month and size category



Model and Data Inputs: Fishery Independent

And 3 indices of abundance:

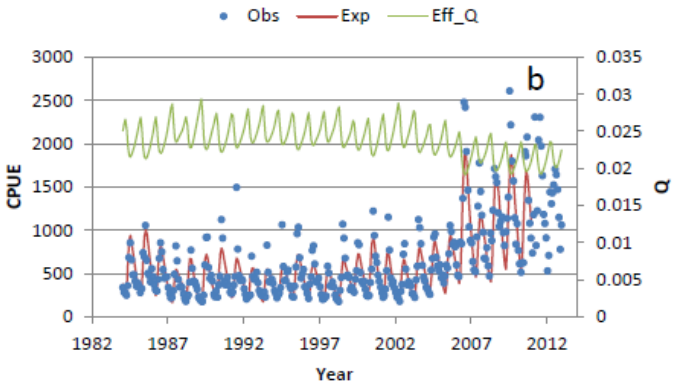
- SEAMAP Summer Groundfish Trawls (Fisheries-independent; 1987-2012) (25 yrs)
- SEAMAP Fall Groundfish Trawls (Fisheries-independent; 1987- 2012) (25 yrs)
- Louisiana Inshore Shrimp Trawl Surveys (Fisheries-Independent 1984-2012) (28 yrs)

SEAMAP Data – SEAMAP data collected by NOAA Fisheries research vessels and State Fisheries agencies.

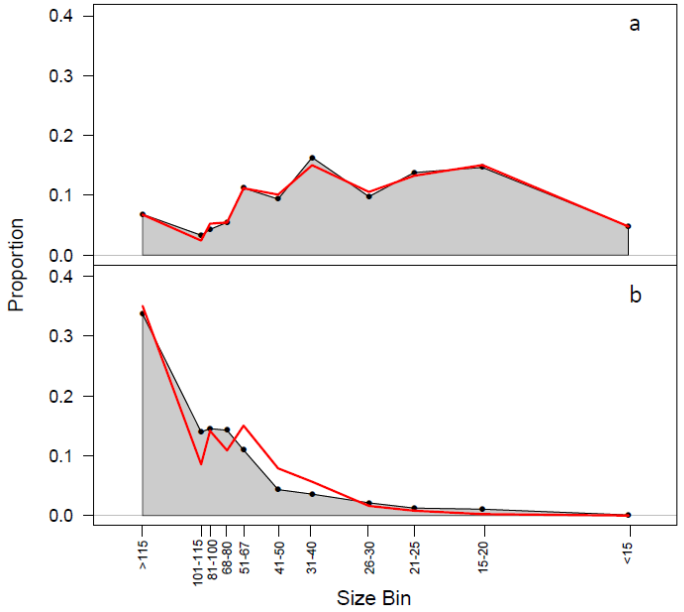
Louisiana Inshore Shrimp Survey Data - Data were collected by State Fisheries agencies.

- CPUE (delta log normal index)
- Size compositions

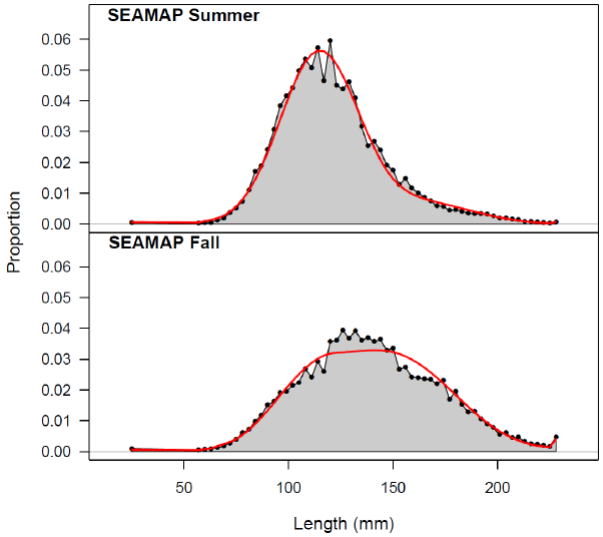
2012 Stock Synthesis Modeling Fits



Brown shrimp CPUE and Q fits for Offshore fleet.

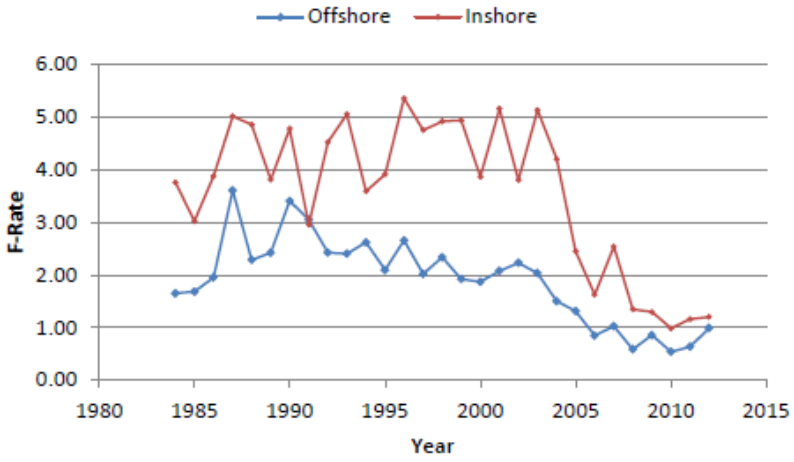


Commercial size composition fits.

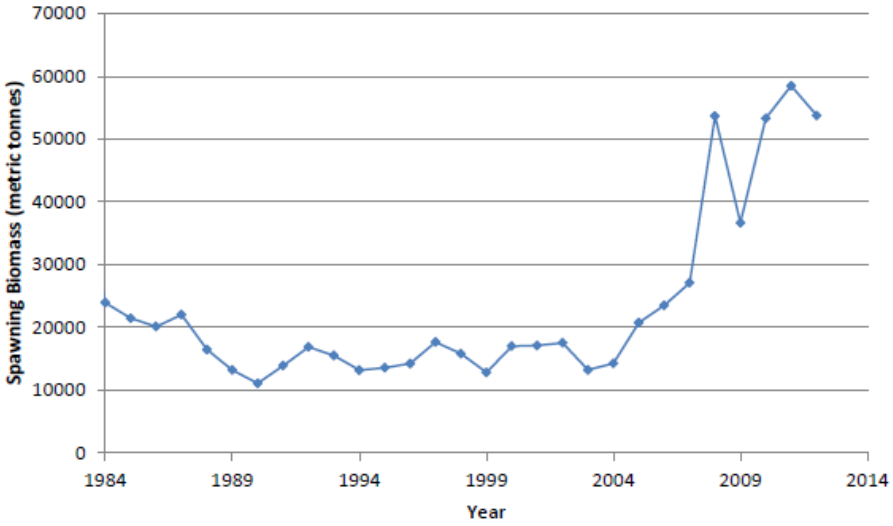


Size composition fits for the Summer and Fall SEAMAP

2012 Stock Synthesis Modeling Outputs



Brown shrimp annual apical F-values values



Brown shrimp spawning biomass

Stock Synthesis Modeling Strengths:

› Peer-reviewed model.

› Excellent model support.

› Ability to fully support range of catch and effort data.

› Ability to incorporate fishery independent data.

› Ability to incorporate environmental data.

Stock Synthesis Modeling Challenges:

› Reference point development with monthly outputs.

› Commercial data availability (timeliness).

› Fishery independent data availability (coverage).

› Lead responsible for 3 assessments each year.

Questions ?